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CHEMISTRY

MULTIPLE CHOICE - 3

ATOMIC STRUCTURE

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Atomic Structure - 3

1) Helping Concept

Number of electrons and number of neutrons in carbon – 14

are 6 and 8 respectively, which are same as those of $^{16}\text{O}^{2+}$.

2) Helping Concept

A: Atoms contain sub – atomic particle, e. g. ${}^1_0\text{n}$, ${}^1_1\text{p}$, ${}^0_{-1}\text{e}$

C: Isotopes of an element are not identical.

D: Isoopes of different elements may have the same mass, e. g $^{32}_{16}\text{S}$, $^{32}_{15}\text{P}$

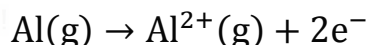
3) Helping Concept

In Q, there are 44 electrons and its electronic configuration is $[\text{Ar}]3\text{d}^{10}4\text{s}^24\text{p}^64\text{d}^65\text{s}^2$.

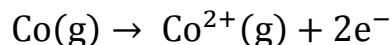
Hence, Q^{2+} has 42 electrons and its electronic configuration is $[\text{Ar}]3\text{d}^{10}4\text{s}^24\text{p}^64\text{d}^6$.

Note: The 2 electrons lost in forming Q^{2+} are from the qutermost 5s orbital

4) Helping Concept



$$\Delta H = 577 + 1820 = 2397\text{kJ mol}^{-1}$$



$$\Delta H = 757 + 1640 = 2397\text{kJ mol}^{-1}$$

5) Helping Concept

Electrons furthest away from the nucleus are removed first.

the electrons in Ga are removed in the order: 4p 4s 3d.

6) Helping Concept

There is a large difference between the 6th and 7th ionization energies, indicating that the 6th and 7th electrons are from different principal quantum shells.

Hence, X is a Group VI element, i. e. o or Te. However, X is Te.

7) Helping Concept

There is a large increase from 4th I. E. to 5th I. E. This shows that the 5th electrons is removed from an inner principal quantum shell. Hence, there are 4 valence electrons and it is therefore a Group IV element.

8) Helping Concept

Given a nuclide ${}^n_m\text{X}$,

Where n = mass number or nucleon number

= number of protons and neutrons

m = atomic number or proton number

= number of protons

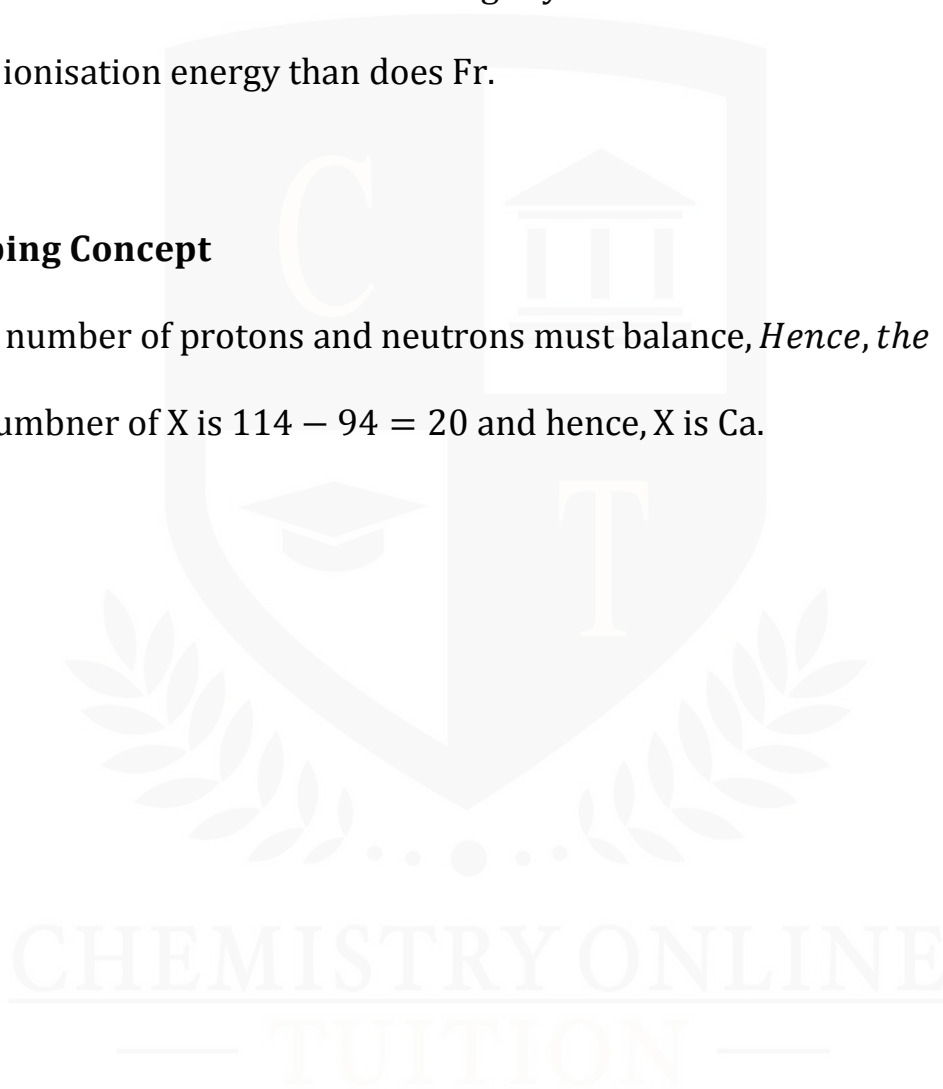
Since both ${}^{40}_{18}\text{Ar}$ and ${}^{40}_{19}\text{K}$ have the same value of n , they have the same nucleon number.

9) Helping Concept

Rn is in Group 0 (octet configuration) and it has the highest first ionisation energy, i. e. most endothermic. Being in the same period, Ra is smaller and has 1 proton more than Fr since Ra is in Group II and Fr is in Group 1. Consequently, the valence electrons in Ra are more tightly bound and it has a more endothermic first ionisation energy than does Fr.

10) Helping Concept

The total number of protons and neutrons must balance, *Hence, the* proton number of X is $114 - 94 = 20$ and hence, X is Ca.



I am Sorry !!!!!



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